



## Tepee Buttes on our Horizons

By Cindy Smith  
Fremont County Stones 'n Bones

We've all seen them. The mesmerizing little pyramids on the plains left behind some 75 mya when the huge but shallow Western Interior Sea retreated. This sea once stretched from the Gulf of Mexico to Hudson Bay. It was only 200-400' deep, and it ran right through Fremont County.

These head-turners, called Tepee Buttes, are not random nor barren. They offer an insight into ages past when marine life found the hydrocarbons at their core life-giving.

Fremont County has its own Tepee Buttes on private land, though there are more well-known Tepee Buttes east of Pueblo near Baculite Mesa and near Boone (where over 50 buttes cover 1.5 square miles). Mt Pleasant, better known as Spud Hill, in eastern Canon City was a Tepee Butte before being bulldozed, and was a local source of many back garden ornaments.



Each cone-shaped Tepee Butte has at its center a solid limestone core formed by the precipitation of carbonate around the methane seeping from vents on the seafloor some 100-300' underwater. The core, which can be 6' wide and 30' high, is covered by a mix of limestone and shale which is very fossiliferous and full of holes called vugs. This outer layer of the core forms the cone-shaped hills we see east of I-25. The surrounding plains are Pierre Shale (pronounced 'peer') of the Late Cretaceous Period (75 mya) and contain relatively few fossils, indicating that the Buttes were rather like an oasis on the sea floor.

A variety of fossils found near Tepee Buttes provides evidence of a once-thriving community of invertebrates, life that found the methane very attractive for over 1.25 my. Closest to the core we find fossil clams, *Nymhalucina occidentalis*, which did so well in these conditions that their shells

often form a coquina, a limestone plate composed of many shells all cemented together. This clam species is only found near these Tepee Buttes; it is not found anywhere else in the world! Another distinctive clam found near Tepee Buttes is the *Inoceramus*, a large clam with concentric growth lines on its shell; the same type of clam (but a different species) is often found on the east side of Skyline Drive.

Other common fossils found near Tepee Buttes are ammonites, baculites (uncoiled ammonites), and gastropods (snails). Fossilized hollow worm tubes show us that worms lived in the methane-rich water just as they do today near modern-day seafloor vents. Single-celled organisms such as foraminifera and radiolaria (discussed by Jim Puckette at the Canon City Geology Club June meeting) are found in the rocks near the core, and bacteria and algae also prospered. The most common ammonites found near Tepee Buttes are *Baculites scotti*, *Didymoceras nebrascense*, *Solenoceras*, and *Scaphites*. Identify your Tepee Butte fossils with help from Wikipedia or *Ammonites and the Other Cephalopods of the Pierre Seaway* by Neal Larson and Steve Jorgensen.

Colorado has Tepee Buttes along the Front Range, running in a line from Pueblo north to South Dakota. These Buttes formed along underwater fault and fracture zones that were created during the Laramide Orogeny, a period of mountain building some 70-80 mya. It was this uplift that produced our current Rocky Mountains.

NASA studies modern and fossil Tepee Buttes on ocean floors in an effort to understand and recognize potential evidence of life preserved on extra-terrestrial bodies. Scientists believe these methane seeps could resemble environments on other planets. Colorado's Cretaceous Tepee Buttes bridge the gap between the modern and ancient Buttes and contain a preserved record of life that gives us as well as NASA the opportunity to study and appreciate the paleontology of these intriguing ancient sites so close to our home.

